

Nitrogen mineralization under saline conditions

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Abstract

The conversion of soil nitrogen (N) from organic to inorganic forms has been the subject of several investigations. N mineralization in salt-affected soils is a subject of much controversy because there are reports of salt induced non-biological ammonification. This study was therefore carried out to observe trends in N mineralization in saline soils amended with animal manure.

A factorial combination of two soil types (normal soil and saline soil) with four treatments (control, poultry manure, goat manure and cow dung) used in laboratory incubation. Nitrogen mineralization was determined at 3, 7, 14, 21, 28, 35, 42, 49, 56 and 70 days after the treatments. The experiment was replicated four times and data were statistically analyzed using SAS package.

The NH_4^+ -N content of both soils reached a peak at day 14 followed by gradual reductions in all treatments. Though, the initial nutrient content of applied manures was different, no significant differences were found among the treatments in terms of N mineralization. However, saline soil showed significantly low NH_4^+ -N content compared to the normal soil. It was very clear throughout the incubation that no distinct pattern of treatment behavior could be observed for NO_3^- -N. However, normal soil maintained a higher NO_3^- -N level throughout the incubation. Therefore, depression of ammonification and nitrification and the overall decrease in net N mineralization with increasing pH or salinity were all evidence of the biological nature of N mineralization in salt-affected soils.

Keywords: Animal Manure, Nitrogen Mineralization, Incubation